

Scottiago Forest Health and Fuels Reduction Project
USDA Forest Service
Eldorado National Forest
Amador Ranger District
El Dorado County, California
9/6/18

Background

The Scottiago Forest Health and Fuels Reduction Project (herein referred to as the “Scottiago Project”) area is located on the Amador Ranger District of the Eldorado National Forest (ENF). Proposed treatment units, which includes both commercial and non-commercial vegetation management and road maintenance and reconstruction activities, are located within the Sopiago Creek, Middle Fork Cosumnes, and Scott Creek watersheds. These landscape-scale areas were designated under the 2014 Farm Bill and subsequent 2015 additional request as high risk to current or future insect and disease attack and which are likely to have significant existing tree mortality.

Project area watersheds are experiencing increasing tree mortality exacerbated by the recent drought which in turn is increasing the risk of wildfire. According to the 2017 aerial detection survey, the Scottiago Project area has elevated levels of recent mortality due to insect outbreaks. High tree stocking levels and dense understory brush contribute to resource competition, leaving trees in the watershed susceptible to insect attack. According to National Insect and Disease risk rating models, proposed treatment areas within the Scottiago Project are categorized as high risk for pests that could destroy over 25 percent of basal area due to current overstocked forest conditions. Project area watersheds have been identified by the state of California as “Tier 1 and 2 High Hazard Zone”, meaning they have both significant existing tree mortality as well as significant community and natural resource assets.

Forest fuel conditions in the Scottiago Project area support high severity wildfires and present significant risks to emergency responders, the public and wildlife populations. Areas along major ridgelines and roadways have been identified as strategic locations for fire suppression and public evacuation. In particular the Omo Ranch Road/Barney Ridge Fuel Break has been identified in cooperation with Sierra Pacific Industries (SPI) and has been established for over 15 years. This fuel break extends from Hwy 88 toward the community of Omo Ranch crossing both National Forest and SPI lands. Despite thinning and prescribed burning in the past, re-growth of vegetation and surface fuel accumulations create the need for continued maintenance to provide for manageable fire behavior. Other areas have had little to no vegetation management over the last 20 years and are densely stocked with trees acting as ladder fuels.

The proposed action was developed in collaboration with the Amador-Calaveras Consensus Group (ACCG), a local collaborative group that works to create healthy forests and watersheds, fire-safe communities, and sustainable local economies. ACCG fosters partnerships among private, nonprofit, state, and federal entities with a common interest in the health and well-being of the landscape and communities in the North Fork Mokelumne, Cosumnes and Calaveras watersheds. The group is advancing an All-Lands

strategy to create a heightened degree of environmental stewardship, local jobs, greater local economic stability, and healthy forests and communities. ACCG principles reflect the group's emphasis on its triple bottom line for balancing environmental, social and economic goals.

Purpose and Need

The purpose of the Scottiago Project is to reduce the threat of insect infestations, improve forest health and reduce catastrophic wildfire risk in the project area. Due in large part to the multi-year drought, bark beetle attacks on ponderosa pines have been prevalent in the project area with the largest scale tree mortality occurring 2016. Increased mortality in white fir, sugar pine, incense cedar, and Douglas-fir has also been observed throughout 2017.

Forest Health

The project area is comprised of mixed conifer and pine dominated stands that generally fall into two categories. One category includes areas that have had some form of commercial harvest, primarily understory thinning from below, in the last 20 years. The other category is the California spotted owl (CSO) protected activity center (PAC), areas that have been generally left unmanaged to provide specific habitat conditions for the CSO. The greatest risk from both insect and disease related mortality as well as high severity wildfire exists in the CSO PACs. However, due to tree growth in the past 15-20 years, stands that were previously thinned are also currently at risk from insect, disease and drought related mortality.

Stand Density Index (SDI) is a measure of the stocking of a stand of trees based on the number of trees per unit area and diameter at breast height (dbh) of the tree of average basal area, also known as the quadratic mean diameter. It may also be defined as the degree of crowding within stocked areas. It is calculated using data collected in stand exams.

SDI can be used as an indicator of potential risk of insect attack. It is applicable regardless of site class or age. SDI can be compared to a maximum stand density index. Stands which are rated at greater than 55% of the maximum SDI are considered to be imminently susceptible to insect attack due to inter-tree competition. This does not mean that an attack will happen, only that it is likely.

Research has shown that an appropriate maximum SDI for managing ponderosa pine stands is approximately 500. According to Oliver (1995), stands with ponderosa pine stand density index greater than 230 (or approximately 46%) are at imminent risk of bark beetle-associated mortality which is even lower than 55% of maximum. Treatments that reduce stocking or densities below these thresholds significantly reduce risk of mortality if bark beetles invade treated stands. Prevention of mortality is not guaranteed but improves chances that bark beetle attacks will be successfully repelled by healthier trees.

Based on stand data collected in the project area stand density index is averaging above 230 and in some cases is over 400.

Fuels Reduction

High-severity wildfire potential is the result of numerous factors present in the project area including:

- Major drainages are aligned with predominant wind direction,
- High surface fuel loading and abundant ladder fuels,
- Canopy density conducive to supporting crown fire,
- High recreation use and vehicle travel (ignition sources), and
- Potential widespread loss of habitat.

The risk to emergency responders is a product of:

- Protracted escape routes and poor road conditions,
- Inadequate safety zones and staging areas,
- Lack of vantage points, and
- Absence of recently burned, and/or treated fuel breaks.

The proposed actions will address following needs identified in the project area:

1. There is a need to reduce stand densities to increase drought tolerance and to reduce the risk of mortality from insect attack or disease.
2. There is a need to protect, and retain through time, key habitat and old forest characteristics for plant and wildlife species - notably the California spotted owl.
3. There is a need to reduce surface fuels and alter the vegetation structure in strategically located areas to affect a reduction in fire severity and size. In addition, there is a need to remove patches of dead trees that threaten the short and long term goals of managing fuel loads and reducing adverse wildfire effects.
4. There is a need to conduct vegetation treatments that are economically efficient while providing wood supply and jobs to local economies.
5. There is a need to conduct road maintenance and reconstruction in order to provide safe access for fire suppression and access for vegetation treatments. These treatments will occur only on roads used for commercial timber sales.

Project Activities

In order to improve stand resilience to insect and disease pressures, the Scottiago Project will reduce stand density, competing vegetation, and treat fuels on approximately 6000 acres of National Forest System lands within the Sopiago Creek, Middle Fork Cosumnes, and Scott Creek watersheds.

Commercial Harvest

- Treat approximately (up to) 3,000 acres of natural stands and commercial sized plantations by cutting and removing trees between 10 inches and 30 inches diameter breast height (dbh), using ground-based commercial logging methods including whole tree yarding (2982 acres) and skyline logging systems (18 acres). Where feasible, tree tops would be removed to landings as part of skyline logging. Recently killed trees

(snags) within commercial harvest units would be cut and removed concurrently with logging operations without restriction on dbh. Feller bunchers or equivalent type of ground based equipment may be used for cutting and pre-bunching of logs that would be removed using a skyline logging system. Use of equipment in skyline units would generally be limited to 45% slope the exception of using a winch assist system. Winch assisted logging equipment would not be slope limited.

- Snags would be retained consistent with forest LRMP standards. The 4 largest snags will be retained per acre, averaged over the entire project area. Snags will not be evenly spaced across the landscape, but would vary by land allocation and landscape position, such as near roads, ridgetops and streams. Snag positions may be based on desired future conditions. Any snag posing a hazard to life, injury, or property may be removed.
- Remove small trees (4 inches to 10 inches dbh) to landings, or other designated disposal sites, on the mechanically thinned acres.
- Pile tree tops and small trees (biomass) at landings to be made available for either biomass power generation or public fire wood cutting. Material remaining at landings (if not removed by previous methods) would be burned.
- Conduct post-harvest treatments, including grapple or tractor piling of existing and activity fuels, followed by prescribed fire, including both broadcast burning and lighting of piles.

Silvicultural prescriptions will incorporate recommendations from PSW-GTR-220, and meet Forest Plan direction (LRMP 1988, SNFPA 2004). Prescriptions will be designed to meet the following goals:

- Improve forest resiliency by reducing stand densities by thinning. In general, lowest residual stand densities would occur on upper slopes, ridges and southern and western aspects. Targeted residual density would range from 100-140 square feet/acre basal area or approximately 25-30 feet tree spacing (50-70 trees per acre). Although canopy cover would average 50% over treatment units, lower canopy cover would exist in these less dense areas. On lower slopes and transitioning into Riparian Conservation Areas (RCA), as well as on north facing aspects, residual stand densities may be higher with a corresponding increase in canopy cover. Targeted residual density would range from 140-180 square feet/acre basal area or 20-25 feet tree spacing (70-110 trees per acre). Canopy cover in RCAs of perennial and intermittent streams would see the least overall reduction and would likely average closer to 60%.
- Reduce shading and competition around oaks to improve growing conditions.
- Increase the percentage of shade intolerant pine and hardwoods. Maintain a mix of species in pine dominated areas to reduce impacts from western bark beetle.
- Retain clumps of large trees. Clumps may vary in shape and size and range from a group of 4-5 trees up to an acre in size. In general, clumps would be located in the mid to lower slope positions. Preference will be given to clumps comprised of mixed species. Clumps would focus on trees exhibiting characteristics such as multi-top especially in firs and cedars, trees provide nesting structure, large snag inclusions, cavities, and other signs of use by wildlife.
- Within CSO Home Range Core Areas (HRCAs), and in areas identified as high quality habitat and having potential as future nesting sites for CSO, the management focus will

be on retaining areas with highest density of tall trees and denser canopy cover. These areas generally will occur in forest patches >2 acres in size dominated by large trees (generally greater than 150 ft tall) and having >55% canopy cover. Within the project area these areas are generally located on north facing slopes and in riparian conservation areas. Commercial harvest in these areas will be limited to removing trees acting as ladder fuels. Retention areas will focus on clumps of large trees and key features used by CSO as stated in above bullet.

- Manage the intermediate size class (20 to 30 inch DBH), thinning this class primarily by species (shade tolerant) and growth form (those acting as ladder fuels).
- Increase stand variability. Target stand structure would consist of a mixture of clumps, gaps and a matrix of variably spaced trees. Small (.25 acre or less) gaps will be created or enlarged in low productivity sites and where natural openings in the canopy exist. These small gaps will not be evaluated for regeneration.

Fuel Reductions and Management Strategy

- Create a fuel treatment network to reduce extent and severity of wildfires based on the below listed locations:
 - Barney Ridge/Omo Ranch Road
 - Goldnote Ridge/ Road 8N55
 - Big Mountain Ridge/ Road 8N49
 - North-South Road
- Using these locations, create evacuation routes for public egress and emergency responder safety by thinning trees less than 30"dbh within 35' of the centerline of roads. Trees would be selectively removed that are currently impeding the ability for safe access as well as fire suppression activities. (130 acres)
- Beyond the 35' and extending out to 200' from above listed strategic locations, trees up to 18" will be thinned and surface and ladder fuels will be removed. (1013 acres) Post-treatment, these stands will retain their larger trees with minimal modification to overstory canopy. Plantations contained within and adjacent to the above-described fuel break would be treated as part of the fuel break design.
- On an additional approximately 2,617 acres, low intensity prescribed fire will be implemented at any time of year when conditions allow for consumption of surface fuels and low (<15% averaged across the unit; 5-10% averaged in PACs) overstory tree mortality. Reduction or rearrangement of fuel concentrations using hand cutting, piling, chipping and/or other mechanical treatment may also occur on these acres to supplement or complement prescribed burning.
- Install hand or dozer line to limit the extent of prescribed burns
- Use hand and aerial ignition techniques for pile and understory burning
- Reduce fuels and fire hazard 300 feet from key OHV staging areas (Barney, Five Corners, Goldnote, Goldnote East, 36 Tie). Trees up to 18" will be thinned and surface

and ladder fuels will be removed to increase utility of these areas for fire suppression and staging of equipment.

- Thinning of stands near Armstrong Hill lookout tower to enable detection and management of wild and prescribed fires in the Cosumnes and North Fork Mokelumne River watersheds. Thinning will be focused on providing a clear view and will include removal of tall trees. Some trees may exceed 30" dbh. Install a fire detection camera in the existing fire detection lookout tower. Reoccurring maintenance of trees and vegetation (promoting oaks for example) to allow continued effective fire detection.

Treatments for Protection of Spotted Owl Habitat

Mechanical thinning would occur in portions of spotted owl PACs ELD0218 and ELD0167 that are not geographically linked to key roads and ridges listed above. These areas are designated Wildland Urban Intermix (WUI) Defense and Threat Zones, and treatments would be designed to facilitate prescribed burning, and reduce stand mortality effects from both prescribed and wildland fire. Thinning within these spotted owl PACs would be limited to removal of trees 18" dbh and smaller, however upper diameter limit may be lower dependent on stand characteristics. In other words where average stand diameters are smaller, the size of trees to be removed in order to meet objectives may also be smaller. Generally these thinning efforts will concentrate along roadways, and property lines, where access exists. Thinning would concentrate on an approximate 1 tree length or less (100-200') distance into the PAC from roads and property lines. It is estimated that treatments would not exceed 100 acres. Specific treatment locations will take into consideration importance to fuels/fire strategy for the area, as well as nesting disturbance and habitat concerns.

Transportation System

Roads and trails within the project area will be managed consistent with the 2008 Eldorado National Forest Public Wheeled Motorized Travel Management Environmental Impact Statement (Travel Management EIS) and compliant with applicable standards. Roads not identified as open to public use may be blocked by gates, barricades, rocks, other barriers or by signage. In addition to the seasonal closure identified by the Travel Management EIS, roads identified as open for public use may be temporarily closed during inclement weather or during logging operations to protect reconstruction investments and for public safety.

There are approximately 12 miles of road maintenance, 57 miles of road reconstruction, and 1 mile of new temporary road construction within the project boundary area. Temporary roads will be obliterated upon project completion. Road maintenance and reconstruction will provide safe access for project activities as well as for fire suppression purposes. No changes to the Motor Vehicle Use Map are proposed and no roads are proposed to be decommissioned.

General road maintenance activities may include:

- Removal of roadside vegetation,
- Repair of the road running surface and shoulder,
- Drainage structure maintenance,

- Removal of hazard trees,
- Sign repair or replacement,
- Maintenance or replacement traffic gates and barriers, and
- Other similar activities.

General road reconstruction activities may include:

- Replacement of inadequate drainage crossings,
- Installation of water bars and dips on roads with inadequate runoff control,
- Out sloping the road where possible,
- Slope stabilization,
- Widening of traveled way,
- Gate installation to control seasonal use, and
- Other similar activities.

Drainage structures will be designed for 100-year storm events. Water will be used to abate dust during maintenance and reconstruction and from logging traffic with water selected from water drafting sites that have suitable stream flow and access. There are two water holes within the project area which will also be maintained as part of the project. In the event water holes are not suitable for drafting, magnesium chloride will be used for dust abatement.

Design Criteria

Terrestrial Wildlife

Prescribed Burning In California Spotted Owl and Northern Goshawk PACs:

Prescribed burning in PACs will be designed to result in a 5-10% reduction or less in canopy cover, averaged over the treatment unit. Snags (15" dbh and greater) would not be targeted for active lighting. Prior to ignition, current fuel conditions surrounding trees > 30" dbh would be assessed to determine need. Raking would occur if mortality of trees greater than 30" is expected to exceed 5%. If prescribed burning within spotted owl and goshawk PAC boundaries is planned for the nesting season, an attempt will be made to ascertain nesting status pre-lighting,. Based on nesting status, additional mitigation measures, such as exclusion of portions of the proposed burn/PAC, additional fire lines, and different lighting techniques, may be implemented to reduce potential effects to nesting spotted owls and goshawks.

The district wildlife biologist would be notified prior to implementation of the prescribed burn in PACs and when possible, would be onsite to take part in, and/or monitor burning and associated effects.

Additional hand treatments, including handline construction, tree pruning, and cutting of small trees (less than 6 inches dbh), may be conducted within a 1 to 2 acre area surrounding known nest trees, to the extent necessary, to protect nest trees and trees in their immediate vicinity. Downed logs greater than 30" diameter, will not be actively lit during implementation of the burn. Snags will be retained during burn preparation, except where they pose a threat to human health and safety, or perimeter control risk for containment of the fire.

Aquatic Wildlife

Table 1: Operating requirements for ground based mechanized equipment in Riparian Conservation Areas (RCAs) for the Scottiagio Project.

Habitat Type ¹	RCA Zone	Width (feet)	Equipment Requirements	Operating Requirements
Perennial/ Intermittent Streams and Special Aquatic Features (SAFs)	Exclusion Zone	0 to 100 feet from stream or SAF edge; or 0 to 25 feet beyond riparian vegetation, whichever is greater	Prohibited: Mechanical Harvesting/ Shredding ² and Skidding ³	Equipment reach in may be allowed upon consultation with RCA team ⁴ .
Perennial Streams and SAFS	Partial Treatment	100 to 300 feet from stream edge; or 25 feet beyond riparian vegetation to 300 feet	Allowed: Mechanical Harvesting/ Shredding ² and Skidding ³	Ground based equipment operations prohibited on slopes greater than 25%. Use existing skid trails except where unacceptable impact would result. Do not construct new primary skid trails or landings within RCA zones without consultation with the RCA team ⁴ .
Intermittent Streams	No Restrictions	100 to 150 feet from stream edge; or 25 feet beyond riparian vegetation to 150 feet	Allowed: Mechanical Harvesting/ Shredding ² and Skidding ³	
Ephemeral Streams	Exclusion Zone	0 – 25 feet	Prohibited: Mechanical Harvesting/ Shredding ² and Skidding ³	Equipment reach in may be allowed upon consultation with RCA team ⁴ .
	Partial Treatment	25 – 150 feet	Allowed: Mechanical Harvesting/ Shredding ² and Skidding ³	Ground based equipment operations prohibited on slopes greater than 25%. Use existing skid trails except where unacceptable impact would result. Do not construct new primary skid trails or landings within RCA zones without consultation with the RCA Team ⁴ .

¹ Perennial streams flow year long. Intermittent streams flow during the wet season but dry by summer or fall. Ephemeral streams flow only during or shortly after rainfall or snowmelt. Special aquatic features (SAFs) include lakes, ponds, meadows, bogs, fens, wetlands, vernal pools and springs

² Low ground pressure track-laying machines such as feller bunchers and masticators

³ Rubber-tired skidders and track-laying tractors

⁴ RCA team is one or more of the following: Forest Service hydrologist, botanist, or aquatic biologist

⁵ The Riparian Conservation Area (RCA) is 300 feet on each side of perennial streams, 150 feet on each side of intermittent and ephemeral streams, and 300 feet surrounding special aquatic features (springs, seeps, wetlands, meadows, etc.)

Design Criteria Specific to Aquatic Resources

Design Criteria are measures taken as part of the Proposed Action to ensure meeting purpose and need while minimizing the potential for adverse effects. For full descriptions of all Design Criteria refer to the Project record. This document lists the Design Criteria which support the effects analysis for aquatic species and their habitat.

For the applicable Design Criteria discussed below:

Potential breeding habitat for the California red-legged frog (CARLF) occurs below 4,000 feet in elevation, and in ponds and lakes, or perennial and intermittent stream reaches with less than 2% gradient. Potential non-breeding habitat for CARLF includes all land and water within 1 mile of potential breeding habitat. Overland migration occurs during the wet season (defined as starting with the first frontal rain system that deposits a minimum of 0.25 inches of rain after October 15 and ending April 15), which creates a Limited Operating Period (LOP) for certain activities.

General Measures

Protection measures may be altered on the ground for a specific site based on recommendations by relevant specialists (soil scientist, aquatic biologist, botanist, or hydrologist).

- If a sensitive or listed amphibian or turtle is sighted within the Action Area, cease operations in the sighting area, and inform a Forest Service aquatic biologist of the sighting immediately. Before commencing activities, consultation may need to be re-initiated with USFWS for listed species.
- Protect any seeps, springs, bogs and wet areas not located on map found in the field during treatment, with same criteria for Special Aquatic Features (SAFs).
- Do not use tightly woven fiber or monofilament netting (or similar materials) for erosion control or other purposes when netting is left exposed.
- An emergency response plan shall be created and implemented to prevent the contamination of waters from accidental spills of hazardous materials (per BMP 7.4).

Specific Measures

Timber Harvest Operations

- Off-road mechanical equipment operations would not occur within 1-mile of areas identified as suitable CARLF breeding habitat during the wet season (defined as starting with the first frontal rain event that deposits a minimum of 0.25 inches of rain after October 15 and ending April 15).
- Mechanical operations off existing roads within RCA zones, as defined by Table 3, would utilize low ground pressure equipment per S&G 113 (USFS 2004b).
- If sale administrator identifies situation where it appears that a log or portion of tree should be removed from the RCA exclusion zones (0-100 ft. from all streams and SAF), no activity would commence without approval of the RCA team.

- Use existing skid trails and landings to the extent use would avoid impact from new trails and landings. Do not construct new primary skid trails or landings within 100 to 300 feet of perennial streams or SAFs, within 100 to 150 feet of intermittent streams, or within 25 to 150 feet of ephemeral streams unless approved by a hydrologist or aquatic biologist. When expanding or constructing landings or skid trails in the RCA outside these zones utilize guidelines outlining special situations that require consultation with RCA team.
- Minimize construction of skid trails or temporary roads for access into RCAs for fuel treatments, harvest, or hazard tree removal per S&G 113 (USFS 2004b).
 - Where practical, cover primary skid trails within an RCA zone with slash or wood chips as trails are developed, thereby crushing slash, protecting soil mantle and reducing fuel piles to be burned.
 - Rehabilitate skids trails within an RCA zone using de-compaction, back-blading berms, building water bars, and covering with any displaced or available slash.
- Locate new log landings or reuse old landing in such a way as to avoid watershed impacts and associated water-quality degradation (BMP 1.12; USFS 2011). Log landings, new or reused, would be situated outside of RCA zones to the maximum extent possible. If new log landings are needed within RCAs a site-specific review by RCA team would occur prior to construction.
 - Reuse of existing landings within an RCA may occur where creation of a new landing is likely to result in more resource damage than use of the landing within the RCA.
 - Re-used landings within the RCA would be rehabilitated using a combination of de-compaction and slash coverage.
 - Consult with RCA team if new landing construction is needed within 300 feet of perennial streams and SAFS, or within 150 feet of intermittent streams, or 25 feet of ephemeral streams
- Where reach-in is used within an RCA zone, grooves and bare soil created would be mitigated with hand-built water bars and/or slash placement.

CARLF Specific Criteria

- Piles that lie within the RCA (outside of the CARLF buffer) can be burned, but would, to the extent practicable, be ignited in a manner that allows any organisms to flee from the pile (for example, light on the leeward side so that fire moves as a front through the pile).
- No piling/burning would occur within meadows, fens or springs.
- No fuel storage would take place within any of the RCA zones. Refueling would take place in RCAs only where there is no other alternative.
- Piles would not be located within 300 feet of potential CARLF breeding habitat, and 100 feet of all other aquatic habitat.
- Pile burning may take place year-round to reduce fuels. However, between October 15 and April 15, a Limited Operating Period shall be applied for the California red-legged frog (CARLF) so that, starting with the first frontal system that deposits a minimum of 0.25 inches of rain, prescribed fire activities may only resume after a 72-hour drying period.

Water Drafting

- The development of water drafting sources shall follow all applicable guidelines under BMP 2.5 (USFS 2012). Locate water drafting sites to avoid adverse effects to in-stream flows and depletion of pool habitat.
- Water drafting sites would be assessed or surveyed for TES species prior to use and periodically during use depending on operation duration and seasonality. If sensitive, threatened, or endangered species are identified at a potential water drafting site, that site would not be used for water drafting.
- In perennial and intermittent streams, pump intake screens shall have openings not exceeding 3/32-inch (0.09375 inch) and be sized according to the pump intake capacity. Place hose intake into bucket in the deepest part of the pool. Use a low-velocity water pump and do not pump natural ponds to low levels beyond which they cannot recover quickly (approximately one hour).
- For water drafting on fish-bearing streams: do not exceed 350 gallons per minute for stream flow greater than or equal to 4.0 cubic feet per second (cfs); do not exceed 20% of surface flows below 4.0 cfs; and, cease drafting when bypass surface flow drops below 1.5 cfs.
- For water drafting on non-fish-bearing streams: do not exceed 350 gallons per minute for stream flow greater than or equal to 2.0 cfs; do not exceed 50% of surface flow; and, cease drafting when bypass surface flow drops below 10 gallons per minute.
- In-channel water drafting locations would include rocking of approaches and barriers of rock or sloping of drafting pads away from water source to prevent spillage at vehicle from returning to the watercourse.

Design Criteria for Soil and Water Quality

- Single track and skid trails that are at risk of altering and concentrating flow after implementation would be back-bladed or smoothed to obliterate potential hillslope channels and downslope berms.
- Where feasible and within fuel criteria, leave uncut downed wood adjacent to roads and trails, to discourage unauthorized OHV travel.
- Where feasible, place enough excess biomass at the outlet of waterdips and waterbars to dissipate runoff energy and trap sediment.
- Once skid trails are decommissioned, construct earth berms and/or place logs and/or rocks to discourage unauthorized motor vehicle use.
- Use a very high erosion hazard rating when considering application of erosion control on skid trails unless subsoil if feasible.
- Place slash or biomass material on skid trails between landings at a distance of 100 feet from landings. A 25-foot-wide slash mat would also be placed on the downslope portion of landings. All slash mats would be crushed either by equipment treads or equipment heads. Slash mats should be placed far enough away from the pile to allow for dozer lines around piles.
- Although 100% soil cover is considered ideal for soil stabilization, the following minimum values should be retained to the extent practical and allowable by fuel loading limits: 50% on slopes less than 25%; and 70% on slopes greater than 25%.

- Existing skid trails would be used, if appropriate, to limit the extent of new areas of compacted ground within the Action Area.

Design Criteria for Riparian Conservation Areas

- Hazard trees within the mechanical exclusion zone (Table above) may be hand felled away from stream channels and SAFs. If logs can't be removed with reach in, they would be left in place. Any portion of a felled tree outside of the RCA exclusion zones may be bucked and removed. Coordination would occur with the RCA Team for specific site exceptions.
- Within the RCAs, 70% post-implementation soil cover would be maintained when possible and dominated by material less than 3 inch in diameter. Application methods could include cutting and lopping, or mastication of pre-commercial material, cutting and scattering of activity material, non-whole tree harvesting methods, or mulch applications. Utilize on site biomass to generate mulch materials wherever possible.
- Trees that are within the RCA zones and felled into the road prism would be removed as necessary to allow safe vehicle use and permit proper maintenance of the road.
- Skidding and loading equipment would remain outside of RCA exclusion zones, except in those instances where the safe falling of hazard trees requires the control that lining by equipment may provide. In the rare instances where equipment would need to enter the RCA exclusion zones, a member of the RCA team, would review the circumstances and work with the sale administrator.

The removal of dead and unstable live trees (hazard trees) of all sizes would occur along timber haul roads and landings to provide for safety of woods worker and public throughout project implementation, except where restrictions for removal apply.

Botany

User created routes off of Omo Ranch Road and 8N62 will be blocked using rock, bollards, or other native material barriers. These routes are not on the MVUM and currently impact lava cap plant communities and FS Sensitive plants.

Sensitive and watchlist plant populations within the project area would be flagged for avoidance. All ground disturbing activities, landing, skid trails, burn piles, hazard tree removal, brushing, and mechanical equipment, would be excluded from sensitive plant protection areas. Where it is necessary to remove trees or conduct roadside brushing from within site boundaries, the project botanist would be consulted to mitigate impacts. All thinning of trees adjacent to site boundaries would be directionally felled away from the site. If new sensitive plant occurrences are discovered during project implementation the project botanist would be notified to develop necessary protection measures.

All potential habitat for Sensitive Plants would be surveyed prior to project implementation. Any unsurveyed potential habitat would be flagged for avoidance.

Lava caps, which support unique plant communities in the project area, would be protected from motorized equipment and vehicles. Skid trail and Line construction through lava cap communities would be avoided when feasible.

All equipment and vehicles (Forest Service) used for project implementation must be free of invasive plant material before moving into the project area. Equipment will be considered clean when visual inspection does not reveal soil, seeds, plant material or other such debris. Cleaning shall occur at a vehicle washing station or cleaning facility before the equipment and vehicles enter the project area.

Known invasive plant sites along roads in the project area will be flagged prior to implementation and will be avoided as much as possible. If infestation cannot be avoided contact a Forest Service Botanist.

Where proposed work occurs in known invasive plant infestations equipment would be cleaned prior to leaving infested areas.

Any straw or mulch used for erosion control would be certified weed-free. A certificate from the county of origin stating the material was inspected is required.

Archeology/Heritage

The Scottiago project will comply with Section 106 of the National Historic Preservation Act of 1966, as amended in accordance with provisions of the “Programmatic Agreement among the U.S.D.A. Forest Service, Pacific Southwest Region (Region 5), the California State Historic Preservation Officer, the Nevada State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Processes for Compliance with Section 106 of the National Historic Preservation Act for Management of Historic Properties by the National Forest of the Pacific Southwest Region” (Regional PA 2013).

Fuel reduction using hand tools and other activities may be permitted within the boundaries of known Historic Properties, if approved by the District Archaeologist. Sites that are at risk from fire will be flagged and avoided during prescribed understory burning. Sites that are not considered at risk or have previously burned at moderate or high intensity may be included in the prescribed burn at the discretion of the District Archeologist. Construction of fire lines will occur outside of the cultural resource site boundaries unless directed by the District Archaeologist. All machine and hand piles will be placed away from site boundaries at a distance such that site features will not be affected by flames and heat. Hazard tree removal on or in the vicinity of cultural resource sites will be coordinated with the District Archaeologist.

Sites within harvest units or near road maintenance/reconstruction projects will be identified with flagging and avoided during ground disturbing project activities. All thinning of trees adjacent to site boundaries will be directionally felled away from the site. Non-merchantable trees and brush may be removed by hand, within site boundaries, at the direction of the District Archaeologist. Road reconstruction may require the use of Standard Protection Measures or mitigation as per the *Regional PA 2013*.

Should any previously unrecorded cultural resources be encountered during implementation of this project, all work should immediately cease in that area and the District Archaeologist be notified immediately. Work may resume after approval by the District Archaeologist; provided

any recommended Standard Protection Measures are implemented. Should any cultural resources become damaged in unanticipated ways by activities proposed in this project; the steps described in the *Regional PA 2013* for inadvertent effects will be followed.

The District Archaeologist will be kept informed of the status of various stages of the project, so that subsequent field work can proceed in a timely fashion. Monitoring of the area may occur after the project has been completed. This work will be documented in amendments to the Archaeology Specialist Report, as appropriate.